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**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION**

IN RE APPLE PROCESSOR LITIGATION

Master Docket No. 5:18-CV-00147-EJD

CONSOLIDATED AMENDED COMPLAINT

DEMAND FOR JURY TRIAL

CLASS ACTION

1 Plaintiffs Jennifer Abrams, Anthony Bartling, Robert Giraldi, and Jacqueline N. Olson
 2 (“Plaintiffs”), on behalf of themselves and all others similarly situated, by their undersigned
 3 counsel, allege the following upon personal knowledge as to their own respective acts and upon
 4 information and belief, including the investigation of counsel, as to all other matters.

5 **NATURE OF THE ACTION**

6 1. Plaintiffs bring this action against defendant Apple, Inc. (“Apple” or
 7 “Defendant”) on behalf of a Class of persons (defined below) who purchased or leased an Apple
 8 product containing a central processing unit (“CPU”) designed by Apple with ARM-based
 9 architecture (“Apple Processor” or “Processor”).¹ Apple Processors can be found in various
 10 Apple products, including iPhones, iPads, iPods, and the Apple TV (collectively, “iDevices”).

11 2. Apple manufactures and sells computer technology such as laptops, desktop
 12 computers, and iDevices. Part of that business involves the design of Processors that are
 13 incorporated into these iDevices. In 2017, independent security researchers found that Apple
 14 Processors suffered from several design defects—collectively called “Meltdown” and “Spectre”
 15 (the “Defects”—that allow unauthorized third-parties access to sensitive user data that Apple
 16 Processors were supposed to protect.²

17 3. The Defects cannot be “patched” (*i.e.*, fixed remotely via a software update)
 18 because they are embedded in the electrical circuits that make up each Processor’s design.
 19 Current strategies to mitigate the impact of these Defects involve making significant changes to
 20 the root level of Apple iOS and tvOS—the operating systems that run many iDevices, including
 21 iPhones, iPads, and Apple TVs. These changes attempt to block the defective parts of the
 22 Processor from accessing sensitive information. However, recent tests show that such mitigation
 23 strategies severely degrade Processor performance by as much as 50%, rendering affected
 24 iDevices substantially slower.

25
 26 ¹ These Processors include, but are not limited to, A4, A5, A5X, A6, A6X, A7, A8, A8X, A9,
 A9X, A10 Fusion and A11 Bionic processors.

27 ² See Moritz Lipp et al., *Meltdown*, <https://meltdownattack.com/meltdown.pdf> (last visited June
 28 8, 2018), and Paul Kocher et al., *Spectre Attacks: Exploiting Speculative Execution*,
<https://spectreattack.com/spectre.pdf> (last visited June 8, 2018).

1 4. Significantly, while Apple knew about the Defects months (if not years) before
 2 the public, it concealed those facts and continued to sell iDevices containing defective Processors
 3 without warning unsuspecting consumers. The theoretical possibility of the Meltdown Defect,
 4 for example, was first identified as early as 1995 in a paper published by the Institute of
 5 Electrical and Electronics Engineers. Apple adopted specific changes to iOS and tvOS in 2012 in
 6 an attempt to secretly defend against Meltdown-based attacks. These efforts failed. Apple has
 7 since confirmed public reports that its Processors do in fact suffer from several types of design
 8 flaws that compromise sensitive user data and admitted that the mitigation strategies proposed
 9 results in decreased Processor performance.

10 5. Plaintiffs and Class members who purchased iDevices containing these
 11 Processors suffered injury in fact, monetary damages, including as a result of a degradation in
 12 value, and damage to their property because of Apple's defective Processor designs.

THE PARTIES

14 6. Plaintiff Jennifer Abrams is an individual residing in the State of California. In
 15 2016, Ms. Abrams purchased an Apple iPad Pro containing an Apple A9X processor directly
 16 from Apple at an Apple store in San Francisco, California. In November 2017, Ms. Abrams
 17 purchased an iPhone SE containing an Apple A9 processor directly from Apple at an Apple store
 18 in San Francisco. At the time of her purchases, Ms. Abrams was not aware of the Defects. Had
 19 Ms. Abrams known about the Defects, she would not have purchased the products or paid the
 20 price she did.

21 7. Plaintiff Anthony Bartling is an individual residing in Milford, New Hampshire.
 22 In or about October 2016, Mr. Bartling purchased two iPhone 6s Plus phones containing Apple
 23 A9 processors. In or about December 2017, Mr. Bartling upgraded one of the iPhone 6s phones
 24 to an iPhone 8 Plus, which contains an Apple A11 Bionic processor. At the time of his
 25 purchases, Mr. Bartling was not aware of the Defects. Had Mr. Bartling known about the
 26 Defects, he would not have purchased the products or paid the prices he did.

27 8. Plaintiff Robert Giraldi is an individual residing in the State of New York. In
 28 2016, Mr. Giraldi purchased an iPhone 7 containing an Apple A10 Fusion processor directly

1 from Apple at an Apple store in Williamsburg, New York. At the time of his purchase, he was
 2 not aware of the Defects. Had Mr. Giraldi known of the Defects, he would not have purchased
 3 the product or paid the price he did.

4 9. Plaintiff Jacqueline N. Olson is an individual residing in Locust Valley, New
 5 York. In or about September 2017, Ms. Olson purchased an iPhone 7 containing an Apple A10
 6 Fusion processor. At the time of her purchase, she was not aware of the Defects. Had Ms. Olson
 7 known of the Defects, she would not have purchased the product or paid the price she did.

8 10. Defendant Apple is a business incorporated under the laws of the State of
 9 Delaware with its principal place of business at 1 Infinite Loop, Cupertino, California. Apple is
 10 engaged in the business of designing, manufacturing, distributing, and selling laptops, desktop
 11 computers, iDevices, and other computing devices containing Processors that they design,
 12 modify, and manufacture. Apple designs its products in California, and its marketing efforts
 13 emanate from California.

14 11. References to Apple shall mean (a) Apple's directors, officers, employees,
 15 affiliates, or agents, or anyone authorized to manage, direct, or control Apple; or (b) any persons
 16 who are the parents or alter egos of Defendant, while acting within the scope of their agency,
 17 affiliation, or employment.

JURISDICTION AND VENUE

18 12. The Court has general personal jurisdiction over Apple because Apple's principal
 19 place of business is in this District.

20 13. The Court has jurisdiction under 28 U.S.C. § 1331 because at least one of
 21 Plaintiffs' claims arises under the laws of the United States (*see Count III, below, asserting a*
 22 *claim under the Magnuson-Moss Warranty Act, 15 U.S.C. § 2302, et. seq.*).

23 14. The Court has jurisdiction under 28 U.S.C. § 1332(d), the Class Action Fairness
 24 Act, because the Class contains members, including Plaintiffs Bartling, Giraldi, and Olson, who
 25 are citizens of a state different from the Defendant, there are more than 100 putative Class
 26 members, and the amount in controversy exceeds \$5 million exclusive of interest and costs.
 27

15. Venue is proper in this District under 28 U.S.C. §1331(b)(2) because a substantial part of the events or omissions giving rise to these claims occurred in this District and Apple resides in this District.

INTRADISTRICT ASSIGNMENT

16. Assignment to the San Jose Division of this district is proper under Northern District of California Civil Local Rule 3-2(c) because a substantial part of the events or omissions which give rise to the claims asserted herein occurred, and Defendant's principal place of business is located, in Santa Clara County, California. Under Civil Local Rule 3-2(e), all civil actions which arise in the county of Santa Clara shall be assigned to the San Jose Division.

FACTUAL ALLEGATIONS

A. Background

17. Inside each iDevice is an Apple Processor, which is also known as a central processing unit (“CPU”) or computer “chip.” The Processor is a physical electronic circuit that carries out the instructions of computer programs designed to run on the various iDevices.

18. In performing this function, the Processor interacts heavily with the operating system (“OS”) installed on each iDevice. The OS is a specialized piece of software that manages resources and provides common services that facilitate running computer programs. Apple iPhones, iPads, and iPods generally run an operating system called iOS, while Apple TVs run the tvOS operating system.

19. At the core of both iOS and tvOS is the “kernel,” a specialized program with complete control over everything running on the iDevice. As a result, the kernel has access to all the information used by applications (commonly called “apps”) running on iDevices or otherwise stored in their memory. This includes any sensitive data the user provides to apps running on the iDevice, including for example, credit card numbers, bank account information, and passwords, frequently supplied in the ordinary course of an online transaction.

20. Because the kernel has access to all data, the Processor looks to the kernel to obtain the information it needs to execute various processes. Access to the kernel is controlled by a special piece of data called a “supervisor bit” that signals which parts of the kernel a given

1 program can access and when. For example, where one program might get authorization to
 2 execute a “memory fetch,” *i.e.*, to obtain data from the kernel, another program running at the
 3 same time might be blocked.

4 21. The supervisor bit is meant to help enforce a principle, called “memory isolation,”
 5 by which each program running on an iDevice—and the data those programs rely on—are
 6 segregated from one another. This is an important concept in systems design. Without memory
 7 isolation, any app or program running on an iDevice could access all the information available to
 8 each other program, including sensitive user data.

9 22. Enforcing memory isolation is a time-consuming process. Correctly done, each
 10 memory fetch from the kernel requires the Processor to stop executing regular instructions and
 11 switch from “user mode” into a special “kernel mode,” before entering the kernel to access
 12 memory. The Processor must then switch back to user mode after it leaves the kernel to resume
 13 executing regular instructions, expending time that could be used executing something else.

14 **B. Apple Processors**

15 23. The Meltdown and Spectre Defects are flaws in the way that Apple Processors are
 16 designed to access the kernel. They arise from the inclusion of at least two optimization
 17 techniques—(1) “speculative execution” and (2) “out-of-order execution”³—that are intended to
 18 increase Processor performance by executing tasks preemptively.

19 24. For example, during speculative execution the Processor predicts what a program
 20 will ask it to do next based on past operations and queues up instructions for execution in
 21 advance. The Processor conducts memory fetches from the kernel so that it has the data
 22 necessary to execute these instructions at the ready (*i.e.*, stored in a “cache”). When the program
 23 finally asks the Processor to perform, it checks to see if its guesses were correct. If the Processor
 24

25 26 27 28 ³ Out-of-order execution is where Processors queue up instructions for the running of a program
 in a “reorder buffer,” and then “retire” them in the correct execution order. This is done to save
 time: it allows a program’s instructions to be executed in parallel with, and sometimes before,
 instructions that would normally precede—as opposed to executing processes one after the other.
 At times, this path of the execution of instructions branches off. In other words, one set of
 instructions is contingent upon a preceding instruction going a certain way.

1 was right, it commits to the correctly-guessed process and yields a time-saving performance gain
 2 because work was done during what would normally be idle time. If it was wrong, the Processor
 3 discards the incorrect instruction sets and reverts to the actual request, resulting in performance
 4 comparable to if the Processor had simply waited in the first place.

5 25. In reporting on the Defects, the New York Times analogized speculative
 6 execution to a butler bringing glasses of wine to a user as follows:

7 In a way, modern microprocessors act like attentive butlers, pouring that second
 8 glass of wine before you knew you were going to ask for it.

9 But what if you weren't going to ask for that wine? What if you were going to
 10 switch to port? No problem: The butler just dumps the mistaken glass and gets the
 11 port. Yes, some time has been wasted. But in the long run, as long as the overall
 12 amount of time gained by anticipating your needs exceeds the time lost, all is
 13 well.

14 Except all is not well. Imagine that you don't want others to know about the
 15 details of the wine cellar. It turns out that by watching your butler's movements,
 16 other people can infer a lot about the cellar. Information is revealed that would
 17 not have been had the butler patiently waited for each of your commands, rather
 18 than anticipating them. Almost all modern microprocessors make these butler
 19 movements, with their revealing traces, and hackers can take advantage.⁴

20 26. Significantly, Apple Processors involved in speculative execution do not perform
 21 the ordinary security checks expected to enforce memory isolation. Instead, they only check
 22 whether a program is allowed to access data from the kernel *after* speculative execution is
 23 complete, *i.e.*, when the Processor has already retrieved the necessary data. This exposes
 24 sensitive user information to exploitation by unauthorized third-parties.

25 27. Apple sought to further improve CPU performance by designing its Processors to
 26 include a specific feature called a Branch Target Buffer ("BTB"). The BTB stores recently
 27 executed branch instructions to help the Processor more accurately guess what instructions are
 28 going to be needed next and predict future code addresses based on past executions.

⁴ Zeynep Tufekci, *The Looming Digital Meltdown*, The New York Times (Jan. 6, 2018),
<https://www.nytimes.com/2018/01/06/opinion/looming-digital-meltdown.html?action=click&module=Well&pgtype=Homepage> (last visited June 8, 2018).

1 28. These queued up conditional branches also contain pre-fetched data that should be
 2 blocked from unauthorized access. However, independent research has revealed that it is possible
 3 for attackers to read these data by exploiting the Defects.

4 **C. Meltdown**

5 29. Meltdown allows an attacker to run code to access a dump of an entire kernel
 6 address space, including its memory.

7 30. Meltdown can do this because, as described above, during speculative execution,
 8 the Processor preemptively fetches the data needed to run the predicted instructions from the
 9 kernel and stores that information in the cache. Many of these speculative memory fetches do not
 10 get used. Ordinarily, these cache-stored memory fetches are discarded if they do not ultimately
 11 get authorized and utilized by a process. The Processor cache is not supposed to be readable if
 12 the memory is correctly isolated. However, the Defects allow unauthorized programs to
 13 determine whether data are held in the cache using a “timing attack.”

14 31. A timing attack is a type of “side-channel” attack, *i.e.*, it is based on side-effects
 15 of normal computer operations that inadvertently provide valuable information. Common
 16 examples of side-channel attacks include analyzing sound leaks, electromagnetic leaks, or the
 17 amount of power consumed by a computer. This allows an attacker to glean what the computer
 18 was doing, based on what would have made that precise sound, leaked that amount of
 19 electromagnetism, or consumed precisely that much power. A “timing attack” does this based on
 20 analyzing the passage of time. An attacker monitors how much time certain functions took to
 21 execute and then reverse engineers *what the computer did* based on *how long it took to do it*.

22 32. Here, an attacker can use timing to discern whether secret data have been cached.
 23 For example, if an instruction to read the data uses the cache to do so, it happens fast. If the data
 24 are not cached, the Processor would have to request that the data be read from memory (which is
 25 slower). The attacker can use this difference in timing to detect which of these took place, and
 26 whether the data was already in the cache or not.

27

28

1 33. From that, the attacker can discern the location of the data on the memory and
 2 read every memory address by repeating these steps for any and all memory locations,
 3 effectively resulting in a dump of the entire kernel, including all sensitive information.

4 **D. Spectre**

5 34. The Spectre defect allows an unauthorized third-party to access the kernel by
 6 training a Processor to perform operations that would not normally occur. Unlike Meltdown,
 7 Spectre is not a single type of Defect, but rather a class of multiple design flaws, including the
 8 use of a BTB, to enhance performance. Additionally, Spectre variants continue to be discovered
 9 as of the filing of this Complaint.⁵

10 35. For example, Apple Processors are designed to allow the BTB to touch private
 11 data even before a process is deemed to have authority to access the data. This allows an attacker
 12 to exploit speculative execution and/or out-of-order execution to reach otherwise secret memory.
 13 The attacker does this by performing operations designed to incorrectly train a processor to make
 14 a specific speculative prediction, turning the Processor's own performance-enhancing features
 15 against it. When the Processor speculatively executes these mis-instructions the attacker gains
 16 access to data that would otherwise be secret.

17 **E. Apple**

18 36. Starting in 2010, with the release of the iPhone 4 and the original iPad, all Apple
 19 iDevices have contained custom ARM-based Processors designed by Apple. ARM Holdings, a
 20 British designer of CPUs, develops and patents CPU architecture and then licenses it other
 21 companies, including Apple. Apple takes it from there, adding its own design touches to the
 22 licensed architecture and making the Processors its own. As such, while many companies could
 23 use ARM-based chips in their products, they are all different. Some companies might use ARM-
 24 based chips without modification, others customize the chips. The ARM-based Processors in
 25 Apple's iDevices are uniquely Apple, and the Processors are used exclusively in Apple products:

26
 27 ⁵ <https://www.bankinfosecurity.com/spectre-meltdown-flaws-two-more-variants-discovered-a-11021>.

specifically, iPhones, iPads, and Apple TVs made since 2010, when Apple started customizing the Processors.

37. Therefore, while ARM-based chips are not automatically impacted by Spectre and Meltdown, all Apple Processors are because Apple chose to modify the ARM designs to include speculative execution and out-of-order execution.

38. These design choices are what subject Apple iDevices to Meltdown and Spectre. More importantly, because the decision to include speculative execution and out-of-order execution requires changes at the physical hardware level of each iDevice, the Meltdown and Spectre Defects cannot be fixed by software updates.

39. Apple is aware that its iDevices suffer from the Defects and admits that “Security researchers have recently uncovered security issues known by two names, Meltdown and Spectre. These issues apply to all modern processors and affect nearly all computing devices and operating systems. All Mac systems and iOS devices are affected”⁶

40. Apple responded to the announcement of the Defects on January 4, 2018 with a press release titled “About Speculative Execution Vulnerabilities in ARM-based and Intel CPU’s.” In this press release, Apple revealed for the first time that on December 2, 2017, it released an update to “iOS,” the operating system that powers iDevices, called iOS 11.2, in an attempt to secretly address the Meltdown defect before it was widely reported. Apple then released a separate update called iOS 11.2.2 in response to the Spectre defect on January 8, 2018.⁷

41. Apple tested the impact of the 11.2 update on iPhone performance using four different computer benchmarking programs: Speedometer, ARES-6, GeekBench 4, and JetStream. These applications measure performance by observing how efficiently the CPU can complete certain tasks. However, when testing the impact of the 11.2.2 update Apple only reported the results of three benchmarks tests, omitting the GeekBench 4 test. According to

⁶ See <https://support.apple.com/en-us/HT208394>.

7 Id

1 Apple, the JetStream benchmark test showed a measurable slowdown of “less than 2.5%” on
 2 iPhone Processor performance following the iOS 11.2.2 upgrade described above.⁸

3 42. The results of Apple’s benchmark testing have not been independently
 4 corroborated. In fact, iPhone users testing the impact of the 11.2.2 update, using the GeekBench
 5 4 benchmark test that Apple omitted, reported that Processor performance declined significantly
 6 more than Apple’s other benchmark testing suggested, “showing a significant decrease in
 7 performance up to 50 per cent in most areas” with the worst effected applications slowed by up
 8 to 56 percent.⁹

9 43. This significant drop in Processor performance was further confirmed by the U.S.
 10 Computer Emergency Readiness Team (“CERT”), an organization within the Department of
 11 Homeland Security, which released a “Vulnerability Note” on January 3, 2018, addressing the
 12 impact of software updates for Spectre and Meltdown. CERT noted that “in many cases, the
 13 software fixes for these vulnerabilities will have a negative affect on system performance” and
 14 in-fact “[i]nitial reports from the field indicate that overall system performance is impacted by
 15 many of the available patches for these vulnerabilities.”¹⁰

16 44. CERT also noted that “The underlying vulnerability is primarily caused by CPU
 17 architecture design choices. Fully removing the vulnerability requires replacing vulnerable CPU
 18 hardware.”¹¹

21 ⁸ *Id.*

22 ⁹ Nicholas Fearn, *Apple’s Spectre fix throttles iPhone 6 performance ‘by 40 per cent,’* The
 23 Inquirer (Jan. 15, 2018), <https://www.theinquirer.net/inquirer/news/3024424/apples-spectre-fix-throttles-iphone-6-performance-by-40-per-cent> (last visited June 8, 2018).

24 ¹⁰ *Vulnerability Note VU#584653*, Vulnerability Notes Database (Jan. 3, 2018, rev. Feb. 23,
 25 2018), <https://www.kb.cert.org/vuls/id/584653> (last visited June 8, 2018).

26 ¹¹ Matt Weinberger, *The US Government brutally laid out the magnitude of the Intel processor
 27 vulnerabilities that affect almost everyone (INTC, MSFT, AAPL, GOOG, GOOGL, AMZN),*
 Business Insider (Jan. 4, 2018), <https://www.msn.com/en-us/money/other/the-us-government-brutally-laid-out-the-magnitude-of-the-intel-processor-vulnerabilities-that-affect-almost-everyone-intc-msft-aapl-goog-googl-amzn/ar-BBHSvlC> (last visited June 8, 2018).

1 45. Notably, the Spectre and Meltdown updates released by Apple are only available
 2 for the iOS 11 operating system. Users whose iDevices are incapable of updating to iOS 11,
 3 including the approximately 72.8 million users with the iPhone 4, 4S, 5, and 5C are unable to
 4 download Apple's updates for Spectre and Meltdown. Apple has not announced any plans to
 5 release updates for these devices.¹²

6 **F. Mitigation Is Impracticable or Impossible**

7 46. The Defects are material because Plaintiffs, Class members, and any reasonable
 8 consumer would not have purchased Apple iDevices, or paid the prices they did, had they known
 9 data stored on their systems would be compromised.

10 47. The Defects are unprecedented in scope in that they expose millions of Apple
 11 iDevices to unauthorized access by third-parties because Apple designed the Processors to use
 12 speculative execution and out-of-order execution in this unprotected way. To date, all proposed
 13 mitigation strategies result in substantial performance degradation. For example, experts have
 14 proposed moving the kernel to a separate address space. But, switching between two address
 15 spaces for every memory fetch takes time, resulting in a computer running slower. In another
 16 example, experts have proposed adding speculative execution blocking instructions. In other
 17 words, a conditional branch speculative execution can be halted if a path is particularly sensitive.
 18 Again, the problem is that doing so severely degrades performance.

19 48. This highlights the difference between Spectre and Meltdown. Meltdown exploits
 20 scenarios where CPUs allow out-of-order execution of *user* instructions to read kernel memory.
 21 Thus, mitigation proposals (which result in degraded performance), by preventing speculative
 22 execution of instructions in certain user processes from accessing kernel memory, would not do
 23 anything to mitigate Spectre. Spectre exploits scenarios where CPUs speculatively execute
 24

25 26 ¹² See *Apple Security Updates* (May 4, 2008), available at <https://support.apple.com/en-us/HT201222> (last visited June 8, 2018); Bernd van der Wielen, *Celebrating 10 Years of iPhones: 63% of all iPhones Ever Sold Are Still in Use - 728 million* (June 29, 2017), <https://newzoo.com/insights/articles/63-percent-of-all-iphones-ever-sold-still-in-use/> (last visited June 8, 2018).

1 instructions that can be read from memory that a process could access on its own. Simply put:
 2 Spectre can manipulate a CPU into revealing its own data while Meltdown can be used to
 3 read privileged memory in a process's address space that even the process itself would normally
 4 be unable to access that information itself.

5 **G. Apple's Knowledge of the Defects**

6 49. Apple knew of the Defects long ago. Apple either knew, or should have known,
 7 of the security defects at least throughout the Class Period. Had Apple been performing proper
 8 tests and security checks of its Apple Processors, the Defects would have been evident. No fewer
 9 than three independent teams working separately (teams from Google Project Zero, Cyberus
 10 Technology, and the Graz University of Technology) were able to discover Meltdown, and two
 11 independent teams (from Google Project Zero and a group of universities) were able to discover
 12 Spectre. Apple, with its access to proprietary information, was in a much better position to
 13 discover the Defects than independent researchers, and as the iDevices containing the defective
 14 Apple Processors were at the center of its business, it had both the obligation and motivation to
 15 do so.

16 50. ARM Holdings PLC, the company that licenses the architecture to Apple with
 17 which Apple designs its chips (which Apple modifies), admits that it was notified of the Defects
 18 in June 2017 by Google's Project Zero and that it immediately notified its architecture licensees
 19 who build on and modify the architecture and create their own processor designs (like Apple).
 20 Various news outlets have reported that "Apple, Linux, and Microsoft have known about the
 21 issue for several months."¹³ The researchers who discovered the Defects note in their academic
 22 paper that: "Using the practice of responsible disclosure, we have disclosed a preliminary version
 23 of our results to Intel, AMD, ARM, Qualcomm as well as to other CPU vendors. We have also

24
 25
 26 ¹³ Juli Clover, *Apple Confirms "Meltdown" and "Spectre" Vulnerabilities Impact All Macs and*
iOS Devices, Some Fixes Already Released [Updated], MacRumors (Jan. 4, 2018),
<https://www.macrumors.com/2018/01/04/apple-meltdown-spectre-vulnerability-fixes/> (last
 27 visited June 4, 2018).

28

1 contacted other companies including Amazon, Apple, Microsoft, Google and others.”¹⁴

2 Nonetheless, Apple continued and continues to sell iDevices containing the Defects.

3 51. On January 24, 2018 the U.S. House Energy and Commerce Committee sent a
4 letter to Apple’s Chief Executive Officer, Tim Cook, requesting information surrounding
5 Apple’s decision to keep the Defects secret until their public disclosure in January 2018.¹⁵

6 52. Apple replied by letter on February 14, 2018 and admitted that in June 2017 they
7 were contacted by ARM and informed of the Defects. They also revealed that Intel contacted
8 them in July 2017 to inform them of these same defects in the Intel chips that power Apple
9 computers. Apple admitted they agreed not to disclose the Defects for ninety days, and later
10 advocated for an extension of this period in-part because “mitigations require deep and
11 architectural changes in the software and hardware layers.”¹⁶

12 53. Apple ultimately kept the Defects a secret until information concerning the
13 Defects was leaked on January 2, 2018, and widely reported the following day by the New York
14 Times.¹⁷ This forced Apple to accelerate their response and publicly disclose the Defects ahead
15 of a “coordinated disclosure” date agreed upon by Apple, Intel, Google, Microsoft, Amazon,
16 AMD, and ARM.¹⁸

18 14 Kocher, *supra*, *Spectre Attacks: Exploiting Speculative Execution*,
19 https://spectreattack.com/spectre.pdf, at 3.

20 15 See https://energycommerce.house.gov/wp-content/uploads/2018/01/Meltdown-Spectre-
Letters.pdf (last visited June 8, 2018).

21 16 See https://energycommerce.house.gov/wp-content/uploads/2018/02/Apple-Response-
2.14.18.pdf (last visited June 8, 2018).

22 17 John Leyden & Chris Williams, *Kernel-memory-leaking Intel processor design flaw forces*
23 *Linux, Windows redesign*, The Register (Jan. 2, 2018),
https://www.theregister.co.uk/2018/01/02/intel_cpu_design_flaw/ (last visited June 8, 2018);
24 Cade Metz & Nicole Perlroth, *Researchers Discover Two Major Flaws in the World’s*
Computers, N.Y. Times (Jan. 3, 2018),
https://www.nytimes.com/2018/01/03/business/computer-flaws.html (last visited June 8, 2018).

26 18 See Feb. 7, 2018 letter from the CEO of ARM to the Chair of the U.S. House Energy and
27 Commerce Committee, et al., https://energycommerce.house.gov/wp-
content/uploads/2018/02/Arm_EnergyCommerce_SpectreMeltdown_response7Feb2018.pdf (last
28 visited June 8, 2018).

1 **H. Apple's Extensive Promotion of the Speed, Advanced Capabilities, and**
 2 **Security of its Processors and iDevices**

3 54. Throughout the Class Period, Apple has made numerous representations to the
 4 public, including to Plaintiffs and Class members through extensive and long-term advertising
 5 and promotion efforts, extolling the benefits, capabilities, and quality of its Processors and
 6 iDevices. Apple's representations emanated from Apple's headquarters in California and were
 7 disseminated widely. In particular, Apple has specifically touted the speed of its Processors, the
 8 advanced capabilities of its iDevices that are driven by its Processors, and the security of its
 iDevices. For example:

9 **iPhone 4:**

10 55. On June 7, 2010, Apple announced the launch of its iPhone 4. In a press release
 11 that same day, Apple stated: "Apple® today presented the new iPhone® 4 featuring FaceTime,
 12 which makes the dream of video calling a reality, and Apple's stunning new Retina display, the
 13 highest resolution display ever built into a phone, resulting in super crisp text, images and video.
 14 In addition, iPhone 4 features a 5 megapixel camera with LED flash, HD video recording,
 15 ***Apple's A4 processor***, a 3-axis gyro and up to 40 percent longer talk time—in a beautiful all-new
 16 design of glass and stainless steel that is the thinnest smartphone in the world. iPhone 4 comes
 17 with iOS 4, the newest version of the world's most advanced mobile operating system, which
 18 includes over 100 new features and 1500 new APIs for developers. iOS 4 features Multitasking,
 19 Folders, enhanced Mail, deeper Enterprise support and Apple's new iAd mobile advertising
 20 platform. ... ***iPhone 4 is powered by Apple's new A4 processor that provides exceptional***
 21 ***processor and graphic performance along with long battery life.***"¹⁹

22 56. In an official promotional video released by Apple on or near the launch of the
 23 iPhone 4, Apple specifically touted the capabilities of its A4 Processor. In the video, Apple's
 24 Senior Vice President of Hardware, Bob Mansfield, states: "What's running all this incredible

26 ¹⁹ Press Release, *Apple Presents iPhone 4* (June 7, 2010),
 27 <https://www.apple.com/newsroom/2010/06/07Apple-Presents-iPhone-4/> (last visited June 8,
 28 2018) (emphasis added).

1 software is our A4 chip. **It's custom designed silicon**, and what that gets you is remarkable
 2 speed and efficiency in a really small chip.”²⁰

3 **iPhone 5:**

4 57. In a press release dated September 12, 2012, Apple announced the launch of its
 5 iPhone 5. Apple stated: “The all-new A6 chip was designed by Apple to maximize performance
 6 and power efficiency to support all the incredible new features in iPhone 5, including the
 7 stunning new 4-inch Retina display—all while delivering even better battery life. With up to
 8 twice the CPU and graphics performance, almost everything you do on iPhone 5 is blazing fast
 9 for launching apps, loading web pages and downloading email attachments.”²¹

10 **iPhone 5s:**

11 58. In a press release dated September 10, 2013, Apple announced the launch of its
 12 iPhone 5s. Apple stated: “The all-new A7 chip in iPhone 5s brings 64-bit desktop-class
 13 architecture to a smartphone for the first time. With up to twice the CPU and graphics
 14 performance, almost everything you do on iPhone 5s is faster and better than ever, from
 15 launching apps and editing photos to playing graphic-intensive games—all while delivering great
 16 battery life. Apple also engineered iOS 7 and all the built-in apps to maximize the performance
 17 of the A7 chip. iPhone 5s is the best mobile gaming device with access to hundreds of thousands
 18 of games from the App StoreSM, the A7 chip’s 64-bit architecture and support for OpenGL ES
 19 version 3.0. iPhone 5s delivers incredibly rich and complex visual effects, previously only
 20 possible on Macs, PCs and gaming consoles.”²²

21

22

23 ²⁰ Promotional video, *Apple—iPhone 4 Official Introduction*,
 24 <https://www.youtube.com/watch?v=KEaLJpFxR9Q> (last visited June 8, 2018).

25 ²¹ Press Release, *Apple Introduces iPhone 5* (Sept. 12, 2012),
 26 <https://www.apple.com/newsroom/2012/09/12Apple-Introduces-iPhone-5/> (last visited June 8,
 2018).

27 ²² Press Release, *Apple Announces iPhone 5s—The Most Forward-Thinking Smartphone in the*
 28 *World* (Sept. 13, 2013), <https://www.apple.com/newsroom/2013/09/10Apple-Announces-iPhone-5s-The-Most-Forward-Thinking-Smartphone-in-the-World/> (last visited June 8, 2018).

1 **iPhone 6 and iPhone 6 Plus:**

2 59. In a press release dated September 9, 2014, Apple announced the launch of its
 3 iPhone 6 and iPhone 6 Plus. Apple stated: “With second generation 64-bit desktop-class
 4 architecture, the all-new A8 chip offers faster performance and is more energy efficient,
 5 delivering higher sustained performance with great battery life. With Metal™, a new graphics
 6 technology in iOS 8, developers can take performance of the A8 chip even further to bring
 7 console-class 3D games to iPhone. The A8 chip also includes a new, powerful Apple-designed
 8 image signal processor that enables advanced camera and video features.”²³

9 **iPhone 6s and iPhone 6s Plus:**

10 60. In a press release dated September 9, 2015, Apple announced the launch of its
 11 iPhone 6s and iPhone 6s Plus. Apple stated: “A9, Apple’s third-generation 64-bit chip powers
 12 these innovations with 70 percent faster CPU and 90 percent faster GPU performance than the
 13 A8, all with gains in energy efficiency for great battery life.”²⁴

14 **iPhone 7 and iPhone 7 Plus:**

15 61. In a press release dated September 7, 2016, Apple announced the launch of its
 16 iPhone 7 and iPhone 7 Plus. Apple stated: “The new **custom-designed Apple A10 Fusion** chip
 17 features a new architecture that powers these innovations, making it the most powerful chip ever
 18 in a smartphone, while also getting more time between charges with the longest battery life ever
 19 in an iPhone. The A10 Fusion’s CPU now has four cores, seamlessly integrating two high-
 20 performance cores that run up to two times faster than iPhone 6, and two high-efficiency cores
 21 that are capable of running at just one-fifth the power of the high-performance cores. Graphics

22
 23
 24 ²³ Press Release, *Apple Announces iPhone 6 & iPhone 6 Plus—The Biggest Advancements in*
25 iPhone History (Sept. 9, 2014), <https://www.apple.com/newsroom/2014/09/09Apple-Announces-iPhone-6-iPhone-6-Plus-The-Biggest-Advancements-in-iPhone-History/> (last visited June 8, 2018).

26 ²⁴ Press Release, *Apple Introduces iPhone 6s & iPhone 6s Plus* (Sept. 9, 2015),
 27 <https://www.apple.com/newsroom/2015/09/09Apple-Introduces-iPhone-6s-iPhone-6s-Plus/> (last visited June 8, 2018).

1 performance is also more powerful, running up to three times faster than iPhone 6 at as little as
 2 half the power, enabling a new level of gaming and professional apps.”²⁵

3 62. In a promotional video for the iPhone 7 released by Apple on or about
 4 September 7, 2016, the narrator (Apple’s Greg Joswiak, Vice President of Worldwide Product
 5 Marketing), states: “It makes all the things you do with your iPhone better, faster and more
 6 powerful...It is driven by the A10 fusion chip. The most powerful chip ever in a smartphone.
 7 High performance and high efficiency cores let you do the majority of your tasks at a fraction of
 8 the power giving you the longest battery life of any iPhone...iPhone 7 makes the things you do
 9 most even better...it’s the best iPhone we ever made.”²⁶ This video has been viewed on
 10 YouTube over 27.6 million times.

11 **iPhone 8 and iPhone 8 Plus:**

12 63. In a press release dated September 12, 2017, Apple announced the launch of its
 13 iPhone 8 and iPhone 8 Plus. Apple stated: “A11 Bionic, the most powerful and smartest chip
 14 ever in a smartphone, features a six-core CPU design with two performance cores that are 25
 15 percent faster and four efficiency cores that are 70 percent faster than the A10 Fusion, offering
 16 industry-leading performance and energy efficiency. A new, second-generation performance
 17 controller can harness all six cores simultaneously, delivering up to 70 percent greater
 18 performance for multi-threaded workloads, giving customers more power while providing the
 19 same great battery life. A11 Bionic also integrates an Apple-designed GPU with a three-core
 20 design that delivers up to 30 percent faster graphics performance than the previous generation.
 21 All this power enables incredible new machine learning, AR apps and immersive 3D games.”²⁷

22
 23 ²⁵ Press Release, *Apple introduces iPhone 7 & iPhone 7 Plus, the best, most advanced iPhone*
 24 *ever* (Sept. 7, 2016), <https://www.apple.com/newsroom/2016/09/apple-introduces-iphone-7-iphone-7-plus/> (last visited June 8, 2018).

25 ²⁶ Promotional video, *Apple—Introducing iPhone 7*,
 26 <https://www.youtube.com/watch?v=Q6dsRpVyyWs> (last visited June 8, 2018).

27 ²⁷ Press Release, *iPhone 8 and iPhone 8 Plus: A new generation of iPhone* (Sept. 12, 2017),
 28 <https://www.apple.com/newsroom/2017/09/iphone-8-and-iphone-8-plus-a-new-generation-of-iphone/> (last visited June 8, 2018).

1 64. Apple released a promotional video for the iPhone 8 and iPhone 8 Plus on or
 2 about September 12, 2017, titled “iPhone 8 and iPhone 8 Plus – Unveiled.” The description for
 3 this video on Apple’s YouTube channel states: “iPhone 8 and iPhone 8 Plus. A new durable
 4 glass design and Retina HD display with True Tone. Wireless charging, augmented reality, and
 5 even better cameras. A11 Bionic, the most powerful and smartest chip in a smartphone. And
 6 introducing Portrait Lighting on iPhone 8 Plus. A new generation of iPhone.”²⁸ This video has
 7 been viewed on YouTube more than 16.5 million times.

8 **iPhone X:**

9 65. In a press release dated September 12, 2017, Apple announced the launch of its
 10 iPhone X. Apple stated: “A11 Bionic, the most powerful and smartest chip ever in a smartphone,
 11 features a six-core CPU design with two performance cores that are 25 percent faster and four
 12 efficiency cores that are 70 percent faster than the A10 Fusion, offering industry-leading
 13 performance and energy efficiency. A new, second-generation performance controller can
 14 harness all six cores simultaneously, delivering up to 70 percent greater performance for multi-
 15 threaded workloads, giving customers more power while lasting two hours longer than iPhone 7.
 16 A11 Bionic also integrates an Apple-designed GPU with a three-core design that delivers up to
 17 30 percent faster graphics performance than the previous generation. All this power enables
 18 incredible new machine learning, AR apps and immersive 3D games. The new A11 Bionic
 19 neural engine is a dual-core design and performs up to 600 billion operations per second for real-
 20 time processing. A11 Bionic neural engine is designed for specific machine learning algorithms
 21 and enables Face ID, Animoji and other features.”²⁹

22 66. In a promotional video for the iPhone X, titled “Meet iPhone X,” released by
 23 Apple on or about September 12, 2017, Apple described its A11 Bionic processor as “The most

25 ²⁸ Promotional video, *iPhone 8 and iPhone 8 Plus—Unveiled—Apple*,
 https://www.youtube.com/watch?v=k0DN-BZrM4o (last visited June 8, 2018).

26 ²⁹ Press Release, *The future is here: iPhone X* (Sept. 12, 2017),
 https://www.apple.com/newsroom/2017/09/the-future-is-here-iphone-x/ (last visited June 8,
 2018).

1 powerful and smartest chip ever in a smartphone.”³⁰ This video has been viewed on YouTube
 2 over 24.5 million times. In a separate promotional video for the iPhone X, titled “Introducing
 3 iPhone X,” released on or about September 12, 2017, Apple stated that the iPhone X “is made
 4 even smarter by the A11 bionic chip....,” and the description for this video on Apple’s official
 5 YouTube channel states: “It’s all screen. Face ID lets you unlock with a look. Portrait Lighting
 6 lets you define the light in a scene. Wireless charging. Augmented reality. A11 Bionic, the most
 7 powerful and smartest chip ever in a smartphone. This is iPhone X. Say hello to the future.”³¹
 8 This video has been viewed on YouTube over 35.7 million times.

9 **iPad:**

10 67. In a press release on January 27, 2010, Apple announced the launch of its iPad.
 11 Apple stated: “iPad is powered by A4, Apple’s next-generation system-on-a-chip. Designed by
 12 Apple, the new A4 chip provides exceptional processor and graphics performance along with
 13 long battery life of up to 10 hours.”³²

14 68. In a press release dated March 2, 2011, Apple announced the launch of its iPad 2,
 15 stating that “iPad 2 features Apple’s new dual-core A5 processor for blazing fast performance
 16 and stunning graphics....”³³

17 69. In a press release dated March 7, 2012, Apple announced the launch of its third
 18 generation iPad. Apple stated: “The powerful new A5X chip with quad-core graphics was
 19 specifically designed by Apple to deliver a fast, responsive user experience while supporting the
 20 incredible Retina display. With double the graphics performance of the A5 chip, the A5X

21
 22 ³⁰ Promotional video, *Meet iPhone X—Apple*,
 23 https://www.youtube.com/watch?v=mW6hFttt_KE(last visited June 8, 2018).

24 ³¹ Promotional video, *iPhone X—Introducing iPhoneX—Apple*,
 25 <https://www.youtube.com/watch?v=K4wEI5zhHB0> (last visited June 8, 2018).

26 ³² Press Release, *Apple Launches iPad* (Jan. 27, 2010),
 27 <https://www.apple.com/newsroom/2010/01/27Apple-Launches-iPad/> (last visited June 8, 2018).

28 ³³ Press Release, *Apple Launches iPad 2* (Mar. 2, 2011),
 29 <https://www.apple.com/newsroom/2011/03/02Apple-Launches-iPad-2/> (last visited June 8, 2018).

1 provides a superb balance between performance and power efficiency so users can enjoy all the
 2 benefits of the stunning new display while experiencing a smooth Multi-Touch™ interface,
 3 immersive gameplay, incredible visual depth and all-day battery life that iPad is known for
 4 delivering.”³⁴

5 70. In a press release dated October 23, 2012, Apple announced the launch of its iPad
 6 mini. Apple stated: “The new fourth generation iPad features the amazing 9.7-inch Retina
 7 display and includes a new Apple-designed A6X chip that delivers up to twice the CPU
 8 performance and up to twice the graphics performance of the A5X chip, all while delivering an
 9 incredible 10 hours of battery life in the same thin and light iPad design.”³⁵

10 71. In a press release dated October 22, 2013, Apple announced the launch of its iPad
 11 Air. Apple stated: “The A7 chip in iPad Air and iPad mini with Retina display offers 64-bit
 12 desktop-class architecture, advanced graphics and improved image signal processing from
 13 previous generations. With up to twice the CPU and graphics performance on iPad Air, and up to
 14 four times the CPU and eight times the graphics performance on iPad mini with Retina display,
 15 almost everything you do is faster and better than ever, from launching apps and editing photos
 16 to playing graphic-intensive games—all while delivering all-day battery life. The A7 chip’s 64-
 17 bit architecture and support for OpenGL ES version 3.0 unlocks game console-like visual
 18 effects.”³⁶

19 72. In a press release dated October 16, 2014, Apple announced the launch of its iPad
 20 Air 2. Apple stated: “iPad Air 2 is powered by the new Apple-designed A8X chip, which

22 ³⁴ Press Release, *Apple Launches New iPad* (Mar. 7, 2012),
 23 <https://www.apple.com/newsroom/2012/03/07Apple-Launches-New-iPad/> (last visited June 8,
 24 2018).

24 ³⁵ Press Release, *Apple Introduces iPad mini* (Oct. 23, 2012),
 25 <https://www.apple.com/newsroom/2012/10/23Apple-Introduces-iPad-mini/> (last visited June 8,
 26 2018).

26 ³⁶ Press Release, *Apple Announces iPad Air—Dramatically Thinner, Lighter & More Powerful*
 27 *iPad* (Oct. 22, 2013), <https://www.apple.com/newsroom/2013/10/23Apple-Announces-iPad-Air-Dramatically-Thinner-Lighter-More-Powerful-iPad/> (last visited June 8, 2018).

1 delivers a 40 percent improvement in CPU performance and 2.5 times the graphics performance
 2 of iPad Air, and still delivers the up to 10-hour battery life[] users expect while working, playing
 3 games or surfing the web. Combined with Metal™, the new graphics technology in iOS 8, the
 4 A8X chip unlocks realistic visual effects comparable to the most advanced gaming consoles.”³⁷

5 73. In a press release dated September 9, 2015, Apple announced the launch of its
 6 iPad Pro. Apple stated: ““The iPad Pro is far and away the fastest iOS device we have ever made
 7 — its A9X chip beats most portable PCs in both CPU and graphics tasks, but is thin and light
 8 enough to hold all day”[quoting Philip Schiller, Apple’s senior vice president of Worldwide
 9 Marketing] … iPad Pro delivers groundbreaking performance and energy efficiency, so you can
 10 tackle the most demanding tasks. Apple’s powerful new 64-bit A9X chip, with third-generation
 11 64-bit architecture, provides desktop-class CPU performance and console-class graphics.”³⁸

12 74. In a press release dated March 21, 2016, Apple announced the launch of its iPad
 13 Pro with 9.7 inch screen. Apple stated: “The new iPad Pro is just 6.1mm thin and weighs just
 14 under one pound, yet delivers groundbreaking performance, connectivity and versatility so you
 15 can tackle the most demanding tasks wherever you go. The powerful A9X chip with third-
 16 generation 64-bit architecture provides performance that rivals many laptops and console-class
 17 graphics, while also delivering all-day battery life.”³⁹

18 75. In a press release dated March 21, 2017, Apple announced the launch of an
 19 upgraded iPad. Apple stated: “iPad features a beautifully bright Retina display with over 3.1
 20 million pixels for stunning pictures and videos, and is enclosed in a sturdy yet thin aluminum

21
 22 ³⁷ Press Release, *Apple Introduces iPad Air 2—The Thinnest, Most Powerful iPad Ever* (Oct. 16,
 23 2014), <https://www.apple.com/newsroom/2014/10/16Apple-Introduces-iPad-Air-2-The-Thinnest-Most-Powerful-iPad-Ever/> (last visited June 8, 2018).

24 ³⁸ Press Release, *Apple Introduces iPad Pro Featuring Epic 12.9-inch Retina Display* (Sept. 9,
 25 2015), <https://www.apple.com/newsroom/2015/09/09Apple-Introduces-iPad-Pro-Featuring-Epic-12-9-inch-Retina-Display/> (last visited June 8, 2018).

26 ³⁹ Press Release, *Apple Introduces 9.7-inch iPad Pro* (Mar. 21, 2016),
 27 <https://www.apple.com/newsroom/2015/09/09Apple-Introduces-iPad-Pro-Featuring-Epic-12-9-inch-Retina-Display/> (last visited June 8, 2018).

1 unibody enclosure weighing just one pound for great portability and durability. The Apple-
 2 designed A9 chip with 64-bit desktop-class architecture delivers fast processing and graphics
 3 performance for apps and games, while maintaining the same all-day battery life¹ customers
 4 have come to expect from iPad.”⁴⁰

5 76. In a press release dated June 5, 2017, Apple announced the launch of a further
 6 upgraded iPad Pro. Apple stated: ““These are by far the most powerful iPads we’ve ever created
 7 with the world’s most advanced displays featuring ProMotion, the powerful new A10X Fusion
 8 chip and the advanced camera system of iPhone 7,’ said Greg Joswiak, Apple’s vice president of
 9 Product Marketing. ‘Together with iOS 11 these new iPad Pro models will radically change what
 10 users can do with iPad.’ … iPad Pro delivers groundbreaking performance, connectivity and
 11 versatility to tackle the most demanding tasks. The powerful new 64-bit A10X Fusion chip
 12 provides performance that is faster than most PC laptops shipping today, so tackling complex
 13 tasks like editing photos and 4K video, rendering 3D images or playing games feels effortless. A
 14 six-core CPU and 12-core GPU deliver up to 30 percent faster CPU performance and 40 percent
 15 faster graphics performance than the industry-leading A9X chip, while delivering all-day battery
 16 life.”⁴¹

17 77. In a presentation made at the 2017 Worldwide Developers Conference, published
 18 by Apple on its official YouTube channel on June 9, 2017, Apple’s Greg Joswiak, Vice President
 19 of Worldwide Product Marketing, stated the following concerning the Processors in the iPad Pro:
 20 “Next, let’s talk about performance. iPad is already best in class for performance, but we’re not
 21 resting on our laurels. These are the fastest we’ve ever created. Inside them they’re powered by
 22 the A10X Fusion chip. The A10X has a six core CPU, three high performance cores, three high

23
 24 ⁴⁰ Press Release, *New 9.7-inch iPad features stunning Retina display and incredible performance*
 25 (Mar. 21, 2017), <https://www.apple.com/newsroom/2017/03/new-9-7-inch-ipad-features-stunning-retina-display-and-incredible-performance/> (last visited June 8, 2018).

26 ⁴¹ Press Release, *iPad Pro, in 10.5-inch and 12.9-inch models, introduces the world’s most*
 27 *advanced display and breakthrough performance* (June 5, 2017),
<https://www.apple.com/newsroom/2017/06/ipad-pro-10-5-and-12-9-inch-models-introduces-worlds-most-advanced-display-breakthrough-performance/> (last visited June 8, 2018).

1 efficiency cores, all automatically managed by the Apple performance controller. It also has a 12
 2 core GPU. This is a powerhouse and it delivers 30% faster CPU performance over our already
 3 industry leading A9X and 40% faster graphics performance. Our chip team has done just an
 4 amazing job over the years with the performance improvements and results have been
 5 staggering. They're delivering an industry leading graphics performance that's more than 500
 6 times the original iPad from just a few years ago.”⁴²

7 78. Apple has published additional promotional videos touting the speed and
 8 capabilities of the iPad Pro and its Processor. For example, On June 5, 2017, Apple published a
 9 video titled “A whole new kind of computer,” which promoted the “powerful A10X Fusion
 10 chip” in the iPad Pro.⁴³ On June 9, 2017, Apple published a video promoting the power of the
 11 A10X Fusion Processor in the iPad Pro titled, “A new kind of power.”⁴⁴ On August 17, 2017,
 12 Apple published a video on the multitasking capabilities of the iPad Pro titled “How to get more
 13 things done more quickly with multitasking with iOS 11.”⁴⁵

14 **iDevices (General):**

15 79. In a commercial published by Apple on May 29, 2017, Apple touted the security
 16 of its iPhone. The left side of the screen is referred to as “your phone,” while the right side of the
 17 screen is referred to as “iPhone.” The commercial depicts a thief trying to gain access into the
 18 iPhone side of the screen, but being unable to. The commercial then indicates that the iPhone is
 19 “more secure.” The description accompanying the video on Apple’s official YouTube channel
 20
 21

22
 23 ⁴² Promotional video, *WWDC 2017 Keynote*, <https://www.youtube.com/watch?v=oaqHdULqet0> (last visited June 8, 2018).

24 ⁴³ Promotional video, *iPad Pro—A whole new kind of computer—Apple*,
 25 <https://www.youtube.com/watch?v=1wENU092DDc> (last visited June 8, 2018).

26 ⁴⁴ Promotional video, *iPad Pro—A new kind of power—Apple*,
 27 <https://www.youtube.com/watch?v=jPnooxO6V6k> (last visited June 8, 2018).

28 ⁴⁵ Promotional video, *iPad— How to get more things done more quickly with multitasking with iOS 11—Apple*, <https://www.youtube.com/watch?v=6EoMgUYVqqc> (last visited June 8, 2018).

1 states: "Access to the latest updates keeps your iPhone secure. Life's easier when you switch to
2 iPhone."⁴⁶ This video has been viewed on YouTube more than 2 million times.

3 80. In a commercial published by Apple on May 22, 2017, Apple touted the privacy
4 of its iPhone by depicting the iPhone as more private than other phones.⁴⁷ The description
5 accompanying the video on Apple's official YouTube channel states: "We build iPhone with
6 your privacy in mind. Life's easier when you switch to iPhone."⁴⁸ This video has been viewed on
7 YouTube more than 1.3 million times.

CLASS ACTION ALLEGATIONS

9 81. Plaintiffs bring this action pursuant to Rule 23 of the Federal Rules of Civil
10 Procedure on behalf of themselves and as representatives of the following “Class”.⁴⁹

11 All persons in the United States who purchased or leased from Apple and/or
12 its authorized retailer sellers one or more iPhones, iPads, Apple TVs, or other
products containing processors designed or modified by Apple, at any time
since January 1, 2010.

14 82. As noted, iPhones, iPads, Apple TVs, and other products containing CPUs
15 designed or modified by Apple are referred to as “iDevices.” The period of January 1, 2010 to
16 present is the “Class Period.”

17 83. Plaintiffs also bring this action on behalf of three subclasses. The “California
18 Subclass” is comprised of all Class members who purchased iDevices during the Class Period in
19 California. The “New Hampshire Subclass” is comprised of all Class members who purchased
20 iDevices during the Class Period in New Hampshire. The “New York Subclass” is comprised of
21 all Class members who purchased iDevices during the Class Period in New York. Collectively,

⁴⁶ Promotional video, *iPhone—Security—Apple*, <https://www.youtube.com/watch?v=AszkLviSLlg> (last visited June 8, 2018).

⁴⁷ Promotional video, *iPhone—Privacy—Apple*, <https://www.youtube.com/watch?v=poxjtpArMGc> (last visited June 8, 2018).

26 | 48 *Id*

⁴⁹ Plaintiffs have defined the Class and Subclasses based on currently available information and hereby reserve the right to amend the definition of the Class and/or Subclasses, including, without limitation, membership criteria and the Class Period.

1 the Class, California Subclass, New Hampshire Subclass, and New York Subclass are referred to
 2 as the “Classes.”

3 84. Excluded from the Classes are Defendant, its officers and directors,
 4 management, employees, subsidiaries, or affiliates. Also excluded from the Classes are the Judge
 5 presiding over this action, his or her law clerks, spouse, any other person within the third degree
 6 of relationship living in the Judge’s household, the spouse of each such person, and the United
 7 States Government.

8 85. The Classes are so numerous that joinder of the individual members of the
 9 proposed Classes is impracticable. The Classes include millions of consumers geographically
 10 dispersed throughout the United States. The precise number and identities of Class members
 11 are unknown to Plaintiffs, but are known to Defendant or can be ascertained through discovery,
 12 using records of sales, warranty records, and other information kept by Defendant or its agents.

13 86. Plaintiffs do not anticipate any difficulties in the management of this action as a
 14 class action. The Classes are ascertainable, and there is a well-defined community of interest in
 15 the questions of law and/or fact alleged herein since the rights of each Class member were
 16 infringed or violated in similar fashion based upon Defendant’s uniform misconduct. Notice
 17 can be provided through sales and warranty records and publication.

18 87. Plaintiffs’ claims are typical of the claims of the other members of the Classes.
 19 Plaintiffs and the members of the Classes sustained damages arising out of Defendant’s common
 20 course of conduct in violation of law as complained of herein. The injuries and damages of each
 21 member of the Classes were directly caused by Defendant’s wrongful conduct in violation of the
 22 laws as alleged herein.

23 88. Plaintiffs will fairly and adequately protect the interests of the members of the
 24 Classes. Plaintiffs are adequate representatives of the Classes and have no interests that are
 25 adverse to the interests of absent Class members. Plaintiffs have retained counsel competent and
 26 experienced in class action litigation.

27 89. Questions of law or fact common to the Classes exist as to Plaintiffs and all
 28 Class members, and these common questions predominate over any questions affecting only

1 individual members of the Classes. Among these predominant common questions of law and/or
 2 fact are the following:

- 3 a) Whether Defendant's Processors possess the Defects and the nature of the
 4 Defects;
- 5 b) Whether Defendant made any implied warranties in connection with the sale of
 6 iDevices containing defective Processors;
- 7 c) Whether Defendant breached any implied warranties relating to its sale of
 8 iDevices containing defective Processors by failing to resolve the Defects in the
 9 manner required by law;
- 10 d) Whether Defendant breached any express warranties in connection with the sale
 11 of iDevices containing defective Processors;
- 12 e) Whether Defendant breached any express warranties related to its sale of iDevices
 13 containing defective Processors by failing to resolve the Defects in the manner
 14 required by law;
- 15 f) Whether Defendant was unjustly enriched by selling iDevices with defective
 16 Processors;
- 17 g) Whether Defendant violated applicable consumer protection laws by selling
 18 iDevices with defective Processors or by failing to disclose the Defects, and
 19 failing to provide the relief required by law; and
- 20 h) The appropriate nature and measure of Class-wide relief, including injunctive
 21 relief and damages.

22 90. Defendant engaged in a common course of conduct giving rise to the legal
 23 rights sought to be enforced by Plaintiffs and the Classes. Individual questions, if any, pale by
 24 comparison to the numerous common questions that predominate.

25 91. A class action is superior to other available methods for the fair and efficient
 26 group-wide adjudication of this controversy, and individual joinder of all Class members is
 27 impracticable, if not impossible, because a large number of Class members are located
 28 throughout the United States. Moreover, the cost to the court system of such individualized

litigation would be substantial. Individualized litigation would likewise present the potential for inconsistent or contradictory judgments and would result in significant delay and expense to all parties and multiple courts hearing virtually identical lawsuits. By contrast, the conduct of this action as a class action presents fewer management difficulties, conserves the resources of the parties and the courts, protects the rights of each Class member and maximizes recovery to them.

7 92. Defendant has acted on grounds generally applicable to the entire Class and
8 Subclasses, thereby making final injunctive relief or corresponding declaratory relief
9 appropriate with respect to the Class, or Subclasses, as a whole.

COUNT I
Breach of Implied Warranty Under the California Commercial Code
Cal. Com. Code § 2301, *et seq.*
(On Behalf of the Class and California Subclass)

13 93. Plaintiffs hereby incorporate all the above allegations by reference as if fully
14 set forth herein. Plaintiffs assert this claim individually and on behalf of the Class, and Plaintiff
15 Abrams asserts this claim individually and on behalf of the California Subclass.

16 94. Defendant and its authorized agents and resellers sold Apple iDevices to Plaintiffs
17 and Class members in the regular course of business. Defendant is a “merchant,” within the
18 meaning of Cal. Com. Code § 2314, with respect to the iDevices sold to Class members.

19 95. Defendant impliedly warranted to members of the general public, including
20 Plaintiffs and Class members, that the iDevices were merchantable within the meaning of Cal.
21 Com. Code § 2314(2). That is, Apple impliedly warranted that the iDevices would pass without
22 objection in the trade, are of fair average quality, are fit for the ordinary purposes for which the
23 iDevices are used, are of even kind, quality, and quantity within each iDevice and among all
24 iDevices, are adequately contained, packaged, and labeled, and conform to the promises or
25 affirmations of fact made on the container or product label.

26 96. Plaintiffs and the Class purchased their Apple devices either directly from
27 Defendant or through Defendant's authorized agents and resellers. Pursuant to agreements
28 between Defendant and its authorized agents and resellers, the stores from which Plaintiffs and/or

1 Class members purchased their defective Apple devices (for Class members who did not purchase
2 their defective devices directly from Defendant) are authorized retailers and authorized CPU
3 service facilities. Plaintiffs and Class members are third-party beneficiaries of, and substantially
4 benefited from, such contracts.

5 97. Defendant breached its implied warranties by selling Plaintiffs and Class
6 members defective Apple iDevices. The Defects render the Processors in the iDevices, and
7 therefore the iDevices themselves, unmerchantable and unfit for their ordinary or particular use
8 or purpose. Defendant has refused to recall, repair, or replace, free of charge, all Apple iDevices
9 or any of their defective Processors or refund the prices paid for such iDevices.

10 98. The Defects in the Apple iDevices existed when the iDevices left Defendant's and
11 its authorized agents' and retail sellers' possession and, thus, are inherent in the iDevices and the
12 Processors themselves.

13 99. As a direct and proximate result of Defendant's breach of its implied warranties,
14 Plaintiffs and Class members have suffered damages and continue to suffer damages, including
15 economic damages at the point of sale in terms of the difference between the value of the
16 iDevices as warranted and the value of the iDevices as delivered. Additionally, Plaintiffs and
17 Class members have incurred and/or will incur economic, incidental, and consequential
18 damages in the cost of repair or replacement of their iDevices.

19 100. Plaintiffs and Class members are entitled to legal and equitable relief against
20 Defendant, including damages, specific performance, rescission, attorneys' fees, costs of suit,
21 and other relief as appropriate.

22 101. Plaintiffs provided reasonable notice to Defendant of their breach of warranty
23 claims, including via letter dated May 9, 2018 to Apple's counsel.

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COUNT II**Breach of Express Warranty Under the California Commercial Code
Cal. Com. Code § 2301, *et seq.*
(On Behalf of the Class and California Subclass)**

102. Plaintiffs hereby incorporate all the above allegations by reference as if fully set forth herein. Plaintiffs assert this claim individually and on behalf of the Class, and Plaintiff Abrams asserts this claim individually and on behalf of the California Subclass.

103. Defendant warranted that Apple iDevices were free of Defects when it sold the iDevices to Plaintiffs and members of the Class as described herein. Each covered Apple iDevice came with an express warranty that “warrants the Apple-branded iPhone, iPad, iPod or Apple TV hardware product and the Apple-branded accessories contained in the original packaging (‘Apple Product’) against defects in materials and workmanship when used normally in accordance with Apple’s published guidelines for a period of ONE (1) YEAR from the date of original retail purchase by the end-user purchaser.”⁵⁰

104. Defendant also marketed the increase in speed and performance in its Processors. After implementation of security patches against the Defects, the speed and performance of Defendant’s iDevices and incorporated Processors are not as represented.

105. Plaintiffs and the Class purchased their Apple devices either directly from Defendant or through Defendant’s authorized agents and resellers. Pursuant to agreements between Defendant and its authorized agents and resellers, the stores from which Plaintiffs and/or Class members purchased their defective Apple devices (for Class members who did not purchase their defective devices directly from Defendant) are authorized retailers and authorized CPU service facilities. Plaintiffs and Class members are third-party beneficiaries of, and substantially benefited from, such contracts.

106. As a direct and proximate result of Apple’s breach of warranty, Plaintiffs and each of the Class members have suffered damages and continue to suffer damages.

⁵⁰ See <https://www.apple.com/legal/warranty/products/ios-warranty-document-us.html>.

1 107. As a direct and proximate result of Defendant's breach of warranty, Plaintiffs and
 2 Class members have suffered damages and continue to suffer damages, including economic
 3 damages at the point of sale in terms of the difference between the value of the iDevices as
 4 warranted and the value of the iDevices as delivered. Additionally, Plaintiffs and Class members
 5 have incurred and/or will incur economic, incidental, and consequential damages in the cost of
 6 repair or replacement of their iDevices.

7 108. Plaintiffs and Class members are entitled to legal and equitable relief against
 8 Defendant, including damages, specific performance, rescission, attorneys' fees, costs of suit,
 9 and other relief as appropriate.

10

COUNT III

11

Violation of the Magnuson-Moss Warranty Act
15 U.S.C. § 2302, *et seq.*
(On Behalf of the Class)

12

13 109. Plaintiffs incorporate all the above allegations by reference as if fully set forth
 14 herein. Plaintiffs assert this claim individually and on behalf of the Class.

15

16 110. Plaintiffs satisfy the Magnuson-Moss Warranty Act ("MMWA") jurisdictional
 17 requirement because they allege diversity jurisdiction under the Class Action Fairness Act,
 18 28 U.S.C. § 1332(d)(2).

19

19 111. Plaintiffs and Class members are "consumers" within the meaning of the MMWA,
 20 15 U.S.C. § 2301(4)-(5).

21

21 112. Apple is a "supplier" and "warrantor" within the meaning of 15 U.S.C.
 22 §§ 2301(4)-(5).

23

23 113. Apple iDevices are "consumer products" within the meaning of 15 U.S.C.
 24 § 2301(1).

25

25 114. The MMWA provides a cause of action for any consumer who is damaged by the
 26 failure of a warrantor to comply with a written or implied warranty. 15 U.S.C. § 2310(d)(1).

27

27 115. Defendant expressly and impliedly warranted to members of the public, including
 28 Plaintiffs and Class members, that the iDevices purchased by Class members were free of defects

1 and otherwise merchantable and fit for the ordinary and particular purposes for which the
2 iDevices are required and used.

3 116. Defendant has breached its express and implied warranties because the Apple
4 iDevices sold to Plaintiffs and Class members were not as warranted and were otherwise not
5 merchantable nor fit for the ordinary and particular purposes for which such goods are used in that
6 the Apple Processors suffer from critical security Defects, requiring an operating system-level
7 remedial measure that will degrade the performance of the Processor, and thus degrade the
8 performance of the iDevice.

9 117. Plaintiffs and the Class purchased their Apple devices either directly from
10 Defendant or through Defendant's authorized agents and resellers. Pursuant to agreements
11 between Defendant and its authorized agents and resellers, the stores from which Plaintiffs and/or
12 Class members purchased their defective Apple devices (for Class members who did not purchase
13 their defective devices directly from Defendant) are authorized retailers and authorized CPU
14 service facilities. Plaintiffs and Class members are third-party beneficiaries of, and substantially
15 benefited from, such contracts.

16 118. As a direct and proximate result of Defendant's breach of its express and implied
17 warranties, Plaintiffs and the Class members sustained damages and other losses in an amount to
18 be determined at trial. Apple's conduct damaged Plaintiffs and the Class, who are entitled to
19 recover damages, specific performance, diminution in value, costs, attorneys' fees, rescission,
20 and/or other relief as may be appropriate.

COUNT IV
Violation of the California Consumers Legal Remedies Act
Cal. Civ. Code § 1750, *et seq.*
(On Behalf of the Class and California Subclass)

24 119. Plaintiffs incorporate all the above allegations by reference as if fully set forth
25 herein. Plaintiffs assert this claim individually and on behalf of the Class, and Plaintiff Abrams
26 asserts this claim individually and on behalf of the California Subclass.

27 ||| 120. Defendant is a "person," as defined by California Civil Code § 1761(c).

1 121. Plaintiffs and Class members are “consumers,” within the meaning of California
 2 Civil Code § 1761(d).

3 122. An iDevice is a “good,” within the meaning of California Civil Code § 1761(a).

4 123. Each of Plaintiffs’ purchases of an iDevice was a “transaction,” as defined by
 5 California Civil Code § 1761(e).

6 124. Defendant Apple has violated the Consumers Legal Remedies Act by making false
 7 and/or misleading representations and/or omitting material facts. Apple’s misrepresentations
 8 and/or omissions alleged herein were material.

9 125. Defendant Apple has represented that the iDevices have characteristics, uses, or
 10 benefits that they do not have, in violation of California Civil Code § 1770(a)(5). Apple has made
 11 representations, through extensive and long-term advertising and marketing efforts, as to the
 12 characteristics, uses, and benefits of the iDevices, including representations touting the speed of
 13 the Apple Processors contained in the iDevices, the security of the iDevices, and the advanced
 14 capabilities of the iDevices that are driven by the Processors. These representations are false
 15 and/or misleading because Apple failed to disclose to Plaintiffs and Class members that the Apple
 16 Processors contained in the iDevices suffered from the Defects, the nature of the Defects, that
 17 efforts to mitigate the Defects would cause impaired performance of the iDevices, and that the
 18 Defects cannot be fully repaired without impairing performance of the iDevices. These omitted
 19 facts are contrary to the representations made by Apple.

20 126. Defendant Apple has also represented that the iDevices are of a particular standard,
 21 quality, or grade, when they were of another, in violation of California Civil Code § 1770(a)(7).
 22 Apple has made representations, through extensive advertising and marketing efforts, as to the
 23 quality of the iDevices, including representations touting the speed of the Apple Processors
 24 contained in the iDevices, the security of the iDevices, and the advanced capabilities of the
 25 iDevices that are driven by the Processors. These representations are false and/or misleading
 26 because Apple failed to disclose to Plaintiffs and Class members that the Apple Processors
 27 contained in the iDevices suffered from the Defects, the nature of the Defects, that efforts to
 28 mitigate the Defects would cause impaired performance of the iDevices, and that the Defects

cannot be fully repaired without impairing performance of the iDevices. These omitted facts are contrary to the representations made by Apple.

3 127. Apple had a duty to disclose that the Apple Processors contained in the iDevices
4 suffered from the Defects, the nature of the Defects, that efforts to mitigate the Defects would
5 cause impaired performance of the iDevices, and that the Defects cannot be fully repaired without
6 impairing performance of the iDevices. Apple had knowledge or should have had knowledge of
7 these material facts, these material facts were not known or reasonably accessible to Plaintiffs and
8 Class members, and Apple actively concealed these material facts. Apple also made partial
9 representations about its Processors and iDevices during the Class Period, through advertisements,
10 press releases, and/or other means, that are misleading because Apple did not disclose the material
11 facts about the Defects.

12 128. As a result of Defendant's conduct, Plaintiffs and Class members were harmed.
13 Had Plaintiffs known of the facts concealed by Apple concerning the Defects, Plaintiffs would not
14 have purchased the iDevices or would have paid less for the iDevices. Plaintiffs and Class
15 members are entitled to actual and/or statutory damages, injunctive relief, restitution, punitive
16 damages, and an award of attorneys' fees and costs.

17 129. On May 9, 2018, Plaintiffs provided notice to Defendant, pursuant to California
18 Civil Code § 1782, of the violations of Civil Code § 1770 alleged herein.

COUNT V
Violation of the California Unfair Competition Law
Cal. Bus. & Prof. Code § 17200, et seq.
(On Behalf of the Class and California Subclass)

22 130. Plaintiffs incorporate all of the above allegations by reference as if fully set forth
23 herein. Plaintiffs assert this claim individually and on behalf of the Class, and Plaintiff Abrams
24 asserts this claim individually and on behalf of the California Subclass.

25 131. California's Unfair Competition Law, Cal. Bus. & Prof. Code § 17200, *et seq.*,
26 ("UCL") prohibits unlawful, unfair, and fraudulent business acts or practices.

1 132. Defendant has engaged in unlawful business acts or practices in violation of the
 2 UCL by violating the Consumers Legal Remedies Act, Cal. Civil Code § 1750, *et seq.*, as alleged
 3 above and incorporated herein.

4 133. Defendant has engaged in fraudulent business acts or practices in violation of the
 5 UCL by making misleading statements and/or omitting material facts concerning its Processors.
 6 Apple's misrepresentations and/or omissions alleged herein were material. In particular, Apple
 7 has made representations, through extensive and long-term advertising and marketing efforts, as
 8 to the speed, advanced capabilities, and security of its iDevices. These representations are false
 9 and/or misleading because Apple failed to disclose to Plaintiffs and Class members that the Apple
 10 Processors contained in the iDevices suffered from the Defects, the nature of the Defects, that
 11 efforts to mitigate the Defects would cause impaired performance of the iDevices, and that the
 12 Defects cannot be fully repaired without impairing performance of the iDevices. These omitted
 13 facts are contrary to the representations made by Apple.

14 134. Apple had a duty to disclose that the Apple Processors contained in the iDevices
 15 suffered from the Defects, the nature of the Defects, that efforts to mitigate the Defects would
 16 cause impaired performance of the iDevices, and that the Defects cannot be fully repaired without
 17 impairing performance of the iDevices. Apple had knowledge or should have had knowledge of
 18 these material facts, these material facts were not known or reasonably accessible to Plaintiffs and
 19 Class members, and Apple actively concealed these material facts. Apple also made partial
 20 representations about its Processors and iDevices during the Class Period, through advertisements,
 21 press releases, and/or other means, that are misleading because Apple did not disclose the material
 22 facts about the Defects.

23 135. Members of the public, including Class members, were likely to be deceived by
 24 Defendant's fraudulent business acts or practices alleged herein.

25 136. Defendant's conduct, as alleged herein, also constitutes unfair business acts or
 26 practices because such conduct is immoral, unethical, oppressive, unscrupulous, or substantially
 27 injurious to consumers. The gravity of the harm to Plaintiffs and Class members outweighs any
 28 justification that Defendant can offer for its conduct.

137. Plaintiffs and Class members were injured in fact and lost money or property as a result of Defendant's unlawful, unfair, and fraudulent business acts or practices. Had Plaintiffs and Class members known of the material facts concerning Apple's iDevices and the Defects, as alleged herein, Plaintiffs and Class members would not have purchased the iDevices or would have paid less than they did for the iDevices.

138. Plaintiffs are entitled to restitution and injunctive relief.

COUNT VI
Violation of the Song-Beverly Consumer Warranty Act
Cal. Civ. Code § 1790, et seq.
(On Behalf of the California Subclass)

139. Plaintiffs incorporate all the above allegations by reference as if fully set forth herein. Plaintiff Abrams asserts this claim on behalf of the California Subclass.

140. Defendant designed, manufactured, and sold the iDevices to Plaintiff Abrams and the California Subclass members, either directly or through authorized retail sellers. iDevices are “consumer goods,” as defined in Cal. Civil Code § 1791(a). Plaintiff Abrams and California Subclass members are “buyers,” as defined in Cal. Civil Code § 1791(b). Defendant Apple is a “person,” as defined in Cal. Civil Code § 1791(b).

141. Under Cal. Civil Code § 1792, every sale of consumer goods that are sold at retail in California shall be accompanied by the manufacturer's and the retail seller's implied warranty that the goods are merchantable. Defendant breached this implied warranty of merchantability because the iDevices sold to Plaintiff Abrams and California Subclass members were not of the quality as those generally acceptable in the trade, were not fit for the ordinary purposes for which the goods are used, and were not adequately contained, packaged, and labeled because they contained defective Processors subject to the Defects.

142. As a direct and proximate result of Defendant's breach of its implied warranty, Plaintiffs and the California Subclass members sustained damages and other losses in an amount to be determined at trial. Plaintiff Abrams and the California Subclass members are entitled to damages, injunctive relief, civil penalties (if applicable), and an award of attorneys' fees and costs.

COUNT VII

Breach of Implied Warranty Under New Hampshire Law N.H. Rev. Stat. Ann. § 382-A, *et seq.* (On Behalf of the New Hampshire Subclass)

143. Plaintiffs hereby incorporate all the above allegations by reference as if fully set forth herein. Plaintiff Bartling asserts this claim on behalf of the New Hampshire Subclass. This claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the Federal Rules of Civil Procedure.

144. Defendant and its authorized agents and resellers sold Apple iDevices to Plaintiff Bartling and New Hampshire Subclass members in the regular course of its business. Defendant is a “merchant,” within the meaning of RSA § 382-A:2-104(1), with respect to the iDevices sold to the members of the New Hampshire Subclass.

145. Defendant impliedly warranted to members of the general public, including Plaintiff Bartling and New Hampshire Subclass members, that the iDevices were merchantable within the meaning of N.H. Rev. Stat. Ann. § 382-A:2-314(2). That is, Apple impliedly warranted that the iDevices would pass without objection in the trade, are of fair average quality, are fit for the ordinary purposes for which the iDevices are used, are of even kind, quality, and quantity within each iDevice and among all iDevices, are adequately contained, packaged, and labeled, and conform to the promises or affirmations of fact made on the container or product label.

146. Plaintiff Bartling and New Hampshire Subclass members purchased their Apple devices either directly from Defendant or through Defendant's authorized agents and resellers. Pursuant to agreements between Defendant and its authorized agents and resellers, the stores from which Plaintiff Bartling and/or New Hampshire Subclass members purchased their defective Apple devices (for New Hampshire Subclass members who did not purchase their defective devices directly from Defendant) are authorized retailers and authorized CPU service facilities. Plaintiff Bartling and New Hampshire Subclass members are third-party beneficiaries of, and substantially benefited from, such contracts.

1 147. Defendant breached its implied warranties by selling Plaintiff Bartling and New
2 Hampshire Subclass members defective Apple iDevices. The Defects render the Processors in
3 the iDevices, and therefore the iDevices themselves, unmerchantable and unfit for their ordinary
4 or particular use or purpose. Defendant has refused to recall, repair, or replace, free of charge, all
5 Apple iDevices or any of their defective Processors or refund the prices paid for such iDevices.

6 148. The Defects in the Apple iDevices existed when the iDevices left Defendant's and
7 its authorized agents' and retail sellers' possession and thus are inherent in the iDevices and the
8 Processors themselves.

9 149. As a direct and proximate result of Defendant's breach of its implied warranties,
10 Plaintiff Bartling and New Hampshire Subclass members have suffered damages and continue to
11 suffer damages, including economic damages at the point of sale in terms of the difference
12 between the value of the iDevices as warranted and the value of the iDevices as delivered.
13 Additionally, Plaintiff Bartling and New Hampshire Subclass members have incurred and/or will
14 incur economic, incidental, and consequential damages in the cost of repair or replacement of
15 their iDevices.

16 150. Plaintiff Bartling and New Hampshire Subclass members are entitled to legal and
17 equitable relief against Defendant, including damages, specific performance, rescission,
18 attorneys' fees, costs of suit, and other relief as appropriate.

COUNT VIII
Breach of Express Warranty Under New Hampshire Law
N.H. Rev. Stat. Ann. § 382-A, *et seq.*
(On Behalf of the New Hampshire Subclass)

22 151. Plaintiffs hereby incorporate all the above allegations by reference as if fully set
23 forth herein. Plaintiff Bartling asserts this claim on behalf of the New Hampshire Subclass. This
24 claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the Federal Rules of Civil
25 Procedure.

26 152. Defendant warranted that Apple iDevices were free of Defects when it sold the
27 iDevices to Plaintiff Bartling and members of the New Hampshire Subclass as described herein.
28 Each covered Apple iDevice came with an express warranty that “warrants the Apple-branded

1 iPhone, iPad, iPod or Apple TV hardware product and the Apple-branded accessories contained
 2 in the original packaging ('Apple Product') against defects in materials and workmanship when
 3 used normally in accordance with Apple's published guidelines for a period of ONE (1) YEAR
 4 from the date of original retail purchase by the end-user purchaser.⁵¹

5 153. Defendant also marketed the increase in speed and performance in its CPUs. After
 6 implementation of security patches against the Defects, the speed and performance of
 7 Defendant's iDevices and incorporated Processors are not as represented.

8 154. Plaintiff Bartling and the New Hampshire Subclass members purchased their
 9 Apple devices either directly from Defendant or through Defendant's authorized agents and re-
 10 sellers. Plaintiff Bartling and the New Hampshire Subclass members relied on Defendant's
 11 express warranty when purchasing their Apple devices. Pursuant to agreements between
 12 Defendant and its authorized agents and resellers, the stores from which Plaintiff Bartling and/or
 13 New Hampshire Subclass members purchased their defective Apple devices (for New Hampshire
 14 Subclass members who did not purchase their defective devices directly from Defendant) are
 15 authorized retailers and authorized Processor service facilities. Plaintiff Bartling and New
 16 Hampshire Subclass members are third-party beneficiaries of, and substantially benefited from,
 17 such contracts.

18 155. As a direct and proximate result of Apple's breach of warranty, Plaintiff Bartling
 19 and each of the New Hampshire Subclass members have suffered damages and continue to suffer
 20 damages.

21 156. As a direct and proximate result of Defendant's breach of warranty, Plaintiff
 22 Bartling and New Hampshire Subclass members have suffered damages and continue to suffer
 23 damages, including economic damages at the point of sale in terms of the difference between the
 24 value of the CPUs as warranted and the value of the CPUs as delivered. Additionally, Plaintiff
 25 Bartling and New Hampshire Subclass members have incurred and/or will incur economic,
 26 incidental, and consequential damages in the cost of repair or replacement of their iDevices.

27
 28 ⁵¹ See <https://www.apple.com/legal/warranty/products/ios-warranty-document-us.html>.

157. Plaintiff Bartling and New Hampshire Subclass members are entitled to legal and equitable relief against Defendant, including damages, specific performance, rescission, attorneys' fees, costs of suit, and other relief as appropriate.

COUNT IX
Violation of New Hampshire's Consumer Protection Act
N.H. Rev. Stat. Ann. § 358-A, *et seq.*
(On Behalf of the New Hampshire Subclass)

7 158. Plaintiffs incorporate all of the above allegations by reference as if fully set forth
8 herein. Plaintiff Bartling asserts this claim individually and on behalf of the New Hampshire
9 Subclass. This claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the Federal
10 Rules of Civil Procedure.

11 159. Apple has represented to Plaintiff Bartling and members of the New Hampshire
12 Subclass that its iDevices contain Apple Processors that have characteristics, uses, and benefits
13 that they do not have, in violation of RSA § 358-A:2(VII).

14 160. In addition, Plaintiff Bartling and the New Hampshire Subclass members have
15 suffered injury in fact and lost money or property as a result of unfair competition and deceptive
16 acts by Apple, as Plaintiff Bartling and the New Hampshire Subclass members purchased
17 iDevices containing Apple Processors that they otherwise would not have purchased, or paid
18 more for the iDevices that they would have paid, if Apple had not made misrepresentations
19 and/or concealed or omitted material information about the quality and characteristics of the
20 Apple Processors, including the Processors' speed and security.

161. Plaintiff Bartling and the New Hampshire Subclass members relied upon Apple to disclose all pertinent information about the Apple Processors.

23 162. The actions of Apple, as complained of herein, constitute unfair and deceptive
24 practices committed in violation of the New Hampshire Consumer Protection Act.

25 163. Plaintiff Bartling and the New Hampshire Subclass members have suffered
26 damages as a result of the conduct of Apple because Plaintiff Bartling and the New Hampshire
27 Subclass members were misled into purchasing iDevices that were not what Apple represented to

them to be or paying more for the iDevices containing Apple Processors than they otherwise would have.

164. Apple was aware, or by the exercise of reasonable care should have been aware, that the representations detailed herein were untrue or misleading. Apple was also aware, or by the exercise of reasonable care should have been aware, that the concealments and omissions detailed herein should have been timely disclosed to consumers. Apple was also aware, or by the exercise of reasonable care should have been aware, that it was engaging in unfair or deceptive acts or practices.

165. Plaintiff Bartling and the New Hampshire Subclass members have each been directly and proximately injured by the conduct of Defendant, including by overpaying for the iDevices containing Apple Processors that they would not otherwise have purchased, and having private data exposed to unauthorized third parties or otherwise suffering a dramatic reduction in the performance of their iDevice.

166. As a result of the conduct of Apple, as alleged herein, Plaintiff Bartling and the New Hampshire Subclass members should be awarded actual damages, restitution, and punitive damages pursuant to N.H. Rev. Stat. Ann. § 358-A:10(I), and any other relief the Court deems appropriate.

COUNT X
**Breach of Implied Warranty Under New York Law
(On Behalf of the New York Subclass)**

167. Plaintiffs hereby incorporate all the above allegations by reference as if fully set forth herein. Plaintiffs Giraldi and Olson assert this claim individually and on behalf of the New York Subclass. This claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the Federal Rules of Civil Procedure.

168. Defendant and its authorized agents and resellers sold Apple iDevices to Plaintiffs Giraldi and Olson and New York Subclass members in the regular course of business. Defendant is a “merchant,” within the meaning of N.Y. U.C.C. Law § 2-314, with respect to the iDevices sold to New York Subclass members.

1 169. Defendant impliedly warranted to members of the general public, including
 2 Plaintiffs Giraldi and Olson and New York Subclass members, that the iDevices were
 3 merchantable within the meaning of N.Y. U.C.C. Law § 2-314 (2). That is, Apple impliedly
 4 warranted that the iDevices would pass without objection in the trade under the contract
 5 description, are of fair average quality, are fit for the ordinary purposes for which the iDevices are
 6 used, are of even kind, quality, and quantity within each iDevice and among all iDevices, are
 7 adequately contained, packaged, and labeled, and conform to the promises or affirmations of fact
 8 made on the container or product label.

9 170. Plaintiffs Giraldi and Olson and the New York Subclass members purchased their
 10 Apple devices either directly from Defendant or through Defendant's authorized agents and
 11 resellers. Pursuant to agreements between Defendant and its authorized agents and resellers, the
 12 stores from which Plaintiffs Giraldi and/or Olson and/or the New York Subclass members
 13 purchased their defective Apple devices (for New York Subclass members who did not purchase
 14 their defective devices directly from Defendant) are authorized retailers and authorized CPU
 15 service facilities. Plaintiffs Giraldi and Olson and the New York Subclass members are third-party
 16 beneficiaries of, and substantially benefited from, such contracts

17 171. Defendant breached its implied warranties by selling Plaintiffs Giraldi and Olson
 18 and New York Subclass members defective Apple iDevices. The Defects render the Processors
 19 in the iDevices, and therefore the iDevices themselves, unmerchantable and unfit for their
 20 ordinary or particular use or purpose. Defendant has refused to recall, repair, or replace, free of
 21 charge, all Apple iDevices or any of their defective Processors or refund the prices paid for such
 22 iDevices.

23 172. The Defects in the Apple iDevices existed when the iDevices left Defendant's and
 24 its authorized agents' and retail sellers' possession and thus are inherent in the iDevices and the
 25 Processors themselves.

26 173. As a direct and proximate result of Defendant's breach of its implied warranties,
 27 Plaintiffs Giraldi and Olson and New York Subclass members have suffered damages and
 28 continue to suffer damages, including economic damages at the point of sale in terms of the

1 difference between the value of the iDevices as warranted and the value of the iDevices as
2 delivered. Additionally, Plaintiffs Giraldi and Olson and New York Subclass members have
3 incurred and/or will incur economic, incidental, and consequential damages in the cost of
4 repair or replacement of their iDevices.

5 174. Plaintiffs Giraldi and Olson and New York Subclass members are
6 entitled to legal and equitable relief against Defendant, including damages, specific
7 performance, rescission, attorneys' fees, costs of suit, and other relief as appropriate.

COUNT XI

Breach of Express Warranty Under New York Law (On Behalf of the New York Subclass)

10 175. Plaintiffs hereby incorporate all the above allegations by reference as if fully set
11 forth herein. Plaintiffs Giraldi and Olson assert this claim individually and on behalf of the New
12 York Subclass. This claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the
13 Federal Rules of Civil Procedure.

14 176. Defendant materially warranted that Apple iDevices were free of Defects when it
15 sold the iDevices to Plaintiffs Giraldi and Olson and members of the New York Subclass as
16 described herein. Each covered Apple iDevice came with an express warranty that “warrants the
17 Apple-branded iPhone, iPad, iPod or Apple TV hardware product and the Apple-branded
18 accessories contained in the original packaging (‘Apple Product’) against defects in materials
19 and workmanship when used normally in accordance with Apple’s published guidelines for a
20 period of ONE (1) YEAR from the date of original retail purchase by the end-user purchaser.”⁵²

177. Defendant also marketed the increase in speed and performance in its Processors.
After implementation of security patches against the Defects, the speed and performance of
Defendant's iDevices and incorporated Processors are not as represented.

24 178. Plaintiffs Giraldi and Olson and New York Subclass members purchased their
25 Apple iDevices either directly from Defendant or through Defendant's authorized agents and re-
26 sellers. Plaintiffs Giraldi and Olson and New York Subclass members relied on Defendant's

²⁸ ⁵² See <https://www.apple.com/legal/warranty/products/ios-warranty-document-us.html>.

express warranty when purchasing their Apple iDevices. Pursuant to agreements between Defendant and its authorized agents and resellers, the stores from which Plaintiffs Giraldi and/or Olson and/or New York Subclass members purchased their defective Apple iDevices (for New York Subclass members who did not purchase their defective devices directly from Defendant) are authorized retailers and authorized Processor service facilities. Plaintiffs Giraldi and Olson and New York Subclass members are third-party beneficiaries of, and substantially benefited from, such contracts.

8 179. As a direct and proximate result of Apple's breach of warranty, Plaintiffs Giraldi
9 and Olson and New York Subclass members have suffered damages and continue to suffer
10 damages, including economic damages at the point of sale in terms of the difference between the
11 value of the Processors as warranted and the value of the Processors as delivered. Additionally,
12 Plaintiffs Giraldi and Olson and New York Subclass members have incurred and/or will incur
13 economic, incidental, and consequential damages in the cost of repair or replacement of their
14 iDevices

15 180. Plaintiffs Giraldi and Olson and New York Subclass members are entitled to legal
16 and equitable relief against Defendant, including damages, specific performance, rescission,
17 attorneys' fees, costs of suit, and other relief as appropriate.

COUNT XII
Violations of New York General Business Law § 349
(On Behalf of the New York Subclass)

181. Plaintiffs hereby incorporate all the above allegations by reference as if fully set
forth herein. Plaintiffs Giraldi and Olson assert this claim individually and on behalf of the New
York Subclass. This claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the
Federal Rules of Civil Procedure.

182. Plaintiffs Giraldi and Olson and New York Subclass members have been injured
and suffered damages by violations of section 349(a) of New York General Business Law (the
“GBL”), which states that deceptive acts or practices in the conduct of any business, trade, or
commerce or in the furnishing of any service in the State of New York are unlawful.

183. Defendant engaged in acts and practices in the State of New York that were deceptive or misleading in a material way, and that injured Plaintiffs Giraldi and Olson and New York Subclass members.

184. Specifically, Defendant engaged in deceptive acts or practices by selling iDevices knowing or being aware that their Processors contained a critical security defect. Defendant also engaged in unfair business acts or practices by making warranties, which it refuses to honor. As a direct and proximate result of these violations, Plaintiffs Giraldi and Olson and New York Subclass members suffered actual damages as discussed herein.

185. Plaintiffs Giraldi and Olson and New York Subclass members used Defendant's products and had business dealings with Defendant either directly or indirectly as described above. The acts and practices of Defendant have caused Plaintiffs Giraldi and Olson and New York Subclass members to lose money and property by being overcharged for and paying for the iDevices containing the defective Processors at issue, or being required to purchase an additional non-defective iDevice. Plaintiffs Giraldi and Olson and New York Subclass members have been damaged by Defendant's violations of Section 349 of the GBL, for which they seek recovery of the actual damages they suffered because of Defendant's willful and wrongful violations of section 349, in an amount to be determined at trial.

COUNT XIII
Violations of New York General Business Law § 350
(On Behalf of the New York Subclass)

186. Plaintiffs hereby incorporate all the above allegations by reference as if fully set forth herein. Plaintiffs Giraldi and Olson assert this claim individually and on behalf of the New York Subclass. This claim is alleged in the alternative, as permitted under Rule 8(d)(2) of the Federal Rules of Civil Procedure.

187. New York GBL § 350 prohibits false advertising in the conduct of any business, trade, or commerce.

188. New York GBL § 350 defines false advertising as “advertising, including labeling, of a commodity . . . if such advertising is misleading in a material respect.”

189. Defendant's advertisements were false and misleading in a material way due to false labeling, statements, and omissions regarding the performance and security of its products.

190. Defendant's conduct has caused Plaintiffs Giraldi and Olson and New York Subclass members to lose money and property by being overcharged for and paying for the iDevices containing the defective Processors at issue, or being required to purchase an additional non-defective iDevice. Plaintiffs Giraldi and Olson and New York Subclass members have been damaged by Defendant's violations of Section 350 of the GBL, for which they seek recovery of the actual damages they suffered because of Defendant's willful and wrongful violations of section 350, in an amount to be determined at trial.

COUNT XIV
Strict Liability
(On Behalf of the Classes)

191. Plaintiffs incorporate all of the above allegations by reference as if fully set forth herein. Plaintiffs assert this claim individually and on behalf of the Classes.

192. Defendant Apple designed, manufactured, and sold iDevices, either directly or through authorized retail sellers, to members of the Classes. The iDevices contained Apple Processors that were designed and manufactured by Defendant. The Apple Processors were defective in design because they contained the Defects, Meltdown and Spectre. The Apple Processors were contained in, but also separate and apart from, the iDevices that Plaintiffs and members of the Classes purchased.

193. Plaintiffs and members of the Classes have been harmed because the defective Apple Processors have made the iDevices they purchased unsecure and their personal information subject to invasion. Plaintiffs and members of the Classes have also been harmed because the defective Apple Processors have caused the iDevices to lose performance and value. The Apple Processors' design defect was a substantial factor in causing harm to Plaintiffs and members of the Classes. Plaintiffs and members of the Classes are entitled to damages and injunctive relief.

COUNT XV
Negligence
(On Behalf of the Classes)

194. Plaintiffs incorporate all the above allegations by reference as if fully set forth herein. Plaintiffs assert this claim individually and on behalf of the Classes.

195. Defendant Apple designed, manufactured, and sold iDevices, either directly or through authorized retail sellers, to members of the Classes. The iDevices contained Apple Processors that were designed and manufactured by Defendant. The Apple Processors were defective in design because they contained the Defects, Meltdown and Spectre. The Apple Processors were contained in, but also separate and apart from, the iDevices that Plaintiffs and the members of the Classes purchased.

196. Defendant Apple owed a duty of care to Plaintiffs and members of the Classes, arising from the sensitivity of the information stored on iDevices and the foreseeability of the Apple Processors' data safety shortcomings resulting in an intrusion, to exercise reasonable care in safeguarding personal information. Defendant also had a duty of care to ensure that Apple Processors would function at the quality and speed levels Apple represented. This duty included, among other things, designing, maintaining, monitoring, and testing its Processors to ensure that Class members' data and iDevices were adequately secured and that the Processors would function as promised.

197. Defendant Apple owed a duty to members of the Classes to implement processes that would detect a major defect in its Processors in a timely manner.

198. Defendant Apple also owed a duty to timely disclose the material fact that Apple Processors were defective because they contained the Defects.

199. Defendant Apple breached the duties it owed to Plaintiffs and members of the Classes, and was thus negligent, by failing to use the amount of care in designing and manufacturing the Apple Processors and iDevices that a reasonably careful designer or manufacturer would have used in similar circumstances to avoid exposing others to the foreseeable risk of harm that the iDevices would be unsecure and subject to invasion of

1 Plaintiffs' and members of the Classes' personal information and subject to reduced performance
2 and lost value due to Defendant's mitigation efforts.

3 200. Plaintiffs and members of the Classes were harmed by Defendant's negligence
4 because the iDevices they purchased were unsecure and subject to invasion of Plaintiffs' and
5 members of the Classes' personal information and subject to reduced performance and lost value
6 due to Defendant's mitigation efforts. Defendant knew or should have known about the Defects
7 and that the Defects were likely to cause harm to Plaintiffs and members of the Classes.

8 Defendant's negligence was a substantial factor in causing harm to Plaintiffs and members of the
9 Classes. Plaintiffs and members of the Classes are entitled to damages and injunctive relief.

COUNT XVI

Unjust Enrichment (On Behalf of the Classes)

12 201. Plaintiffs incorporate all of the above allegations by reference as if fully set forth
13 herein. Plaintiffs assert this claim individually and on behalf of the Classes.

14 202. As Plaintiffs and members of the Classes show just grounds for recovering money
15 paid for benefits Defendant received from them, either directly or indirectly, and they have a
16 right to restitution at law.

17 203. Defendant, having received such benefits, is required to make restitution. The
18 circumstances here are such that, as between the two, it is unjust for Defendant to retain such
19 benefit based on the conduct described above. Such money or property belongs in good
20 conscience to the Plaintiffs and members of the Classes and can be traced to funds or property in
21 Defendant's possession. Plaintiffs and members of the Classes have unjustly enriched Defendant
22 through payments and the resulting profits enjoyed by Defendant as a direct result of such
23 payments. Plaintiffs' and members of the Classes' detriment and Defendant's enrichment were
24 related to and flowed from the conduct challenged in this Complaint.

25 204. The purchase and sale of the iDevices in question resulted in money being had
26 and received by Defendant, either directly or indirectly, at the expense of Plaintiffs and members
27 of the Classes under agreements in assumpsit. Plaintiffs and other members of the Classes
28 conferred a benefit upon Defendant by purchasing one or more iDevices containing defective

1 Processors. Defendant had knowledge of the general receipt of such benefits, which Defendant
2 received, accepted, and retained. Defendant owes Plaintiffs and members of the Classes these
3 sums that can be obtained either directly from Defendant or its authorized retailers.

4 205. Under principles of restitution, an entity that has been unjustly enriched at the
5 expense of another by the retention of benefit wrongfully obtained is required to make restitution
6 to the other. In addition, under common law principles recognized in claims of common counts,
7 under the circumstances alleged herein it would be inequitable for Defendant to retain such
8 benefits without paying restitution or restitutionary damages. Such principles require Defendant
9 to return such benefits when the retention of such benefits would unjustly enrich Defendant.
10 Defendant should not be permitted to retain the benefits conferred by Plaintiffs and members of
11 the Classes via payments for the defective Processors. Other remedies and claims may not permit
12 them to obtain such relief, leaving them without an adequate remedy at law.

13 206. Plaintiffs and members of the Classes seek appropriate monetary relief for such
14 claims. Based on the facts and circumstances alleged above, in order to prevent unjust
15 enrichment and to prevent Defendant from taking advantage of its own wrongdoing, Plaintiffs
16 and members of the Classes are further entitled to the establishment of a constructive trust, in a
17 sum certain, of all monies charged and collected or retained by Defendant from which Plaintiffs
18 and members of the Classes may seek restitution.

PRAYER FOR RELIEF

20 | Plaintiffs demand relief as follows:

21 A. That the Court certify this lawsuit as a class action under Rules 23(a), (b)(2), and
22 (b)(3) of the Federal Rules of Civil Procedure, that Plaintiffs be designated as Class and Subclass
23 representatives, and that Plaintiffs' counsel be appointed as counsel for the Class and Subclasses;

24 B. That Defendant be permanently enjoined and restrained from continuing and
25 maintaining the violations alleged herein;

26 C. Awarding Plaintiffs and Class members all proper measures of monetary relief
27 and damages—including actual damages, statutory damages, punitive damages, and/or civil
28 penalties, as appropriate—plus interest to which they are entitled;

D. Awarding equitable, injunctive, and declaratory relief as the Court may deem just and proper, including restitution and restitutionary disgorgement;

E. That the Court award Plaintiffs and the Class their costs of suit, including reasonable attorneys' fees and expenses, as provided by law; and

F. That the Court direct such further relief as it may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiffs demand a jury trial as to all issues triable by a jury.

DATED: June 8, 2018

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